DETAILED ACTION

Response to Arguments

1. Applicant has amended the claims to include new limitations drawn to the sensor measuring a variable distance between the float and the sensor. As agreed in the interview with the attorney mailed 7/22/08, Golladay does not teach a variable sensor.

2. However, Rak teaches a float containing a magnet that works in conjunction with a Hall-effect sensor. Hall-effect sensors are well known in the art. According to the Laboratory for Intelligent Mechanical Systems at Northwestern University, a Hall Effect Sensor, "varies its output in response to a change in magnetic field. They are primarily used for proximity sensing and position/rotation sensing. By placing a hall effect sensor near a magnet attached to your device that moves in some way, you can get a voltage proportional to the distance/orientation of the magnet." It appears from the applicant's specification, that they are using a common Hall Effect sensor to detect the distance of the float/magnet from the sensor, which is proportional to the density. Rak already discloses using a Hall Effect sensor in an ion exchange apparatus for the detection of adequate salt.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kendt in view of Rak. Kendt discloses a dishwasher comprising a housing 11, a tub 12, a spray arm 24, and a water softener 30. The water softener utilizes ion exchange resins, however it does not include a float and sensor for sensing the concentration of salt water. Rak discloses a water softener with such features. This water softener has at least one container 26a for holding an ion-exchange resin, one tank 10 for holding salt and saltwater, a float 48, and a liquid sensing apparatus (col. 4 line 35-36) that determines if the saltwater concentration is sufficient. The liquid sensing apparatus detects the brine concentration by determining if the float has risen to a certain height (col. 3 lines 18-32). The float 48 is mounted on shaft 52 to guide the movement of the float. Rak discloses that the preferable means for detection of the location of the float is a magnet 50 mounted axially within the float and a Hall-effect switch 54 within the shaft on which the float is mounted. Depending on the embodiment, the switches are attached to the control apparatus 20 by wires (56, 82a, 82b). These wires are capable of transmitting a current. As is well-known in the art, Hall effect sensors output a voltage proportional to the distance to the magnet. Thus, a Hall effect sensor is known to detect a variable distance. Rak discloses the same structure of the claimed sensor, and one of ordinary skill knows that Hall-effect sensors can detect variable distance. Thus, the combination of Kendt in view of Rak is considered to obviate the instant application. It would have been obvious at the time of invention to modify Kendt, and include a low salt sensor, as disclosed by Rak, in order to warn the user of low salt conditions.

5. The sensor detects whether the liquid level is sufficient, and thereby the concentration of the brine, based on the distance between the detector and the float. If the liquid level is not high enough, and therefore the concentration is not sufficient, an indication, in the form of an alarm, is given (col. 3 line 61-62). This satisfies the limitation of an information device. Furthermore, this indication is based on a determination of whether the quantities of solid salt and water are sufficient to indicate that an adequate salt supply is present (col. 3 line 68-69), which meets the limitation of informing on the basis of a salt shortage.

6. Claims 12-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rak. Rak discloses a water softener that has at least one container 26a for holding an ion-exchange resin, one tank 10 for holding salt and saltwater, a float 48, and a liquid sensing apparatus (col. 4 line 35-36) that determines if the saltwater concentration is sufficient. The liquid sensing apparatus detects the brine concentration by determining if the float has risen to a certain height (col. 3 lines 18-32). The float 48 is mounted on shaft 52 to guide the movement of the float. Rak discloses that the preferable means for detection of the location of the float is a magnet mounted axially within the float and a Hall effect switch within the shaft on which the float is mounted. Depending on the embodiment, the switches are attached to the control apparatus 20 by wires (56, 82a, 82b). These wires are capable of transmitting a current. As is well-known in the art, Hall effect sensors output a voltage proportional to the distance to the magnet. Thus, a Hall effect sensor is known to detect a variable distance. Rak discloses the same

structure of the claimed sensor, and one of ordinary skill knows that Hall-effect sensors can detect variable distance. Thus, Rak obviates the instant application.

7. The sensor detects whether the liquid level is sufficient, and thereby the concentration of the brine, based on the distance between the detector and the float. If the liquid level is not high enough, and therefore the concentration is not sufficient, an indication, in the form of an alarm, is given (col. 3 line 61-62). This satisfies the limitation of an information device. Furthermore, this indication is based on a determination of whether the quantities of solid salt and water are sufficient to indicate that an adequate salt supply is present (col. 3 line 68-69), which meets the limitation of informing on the basis of a salt shortage.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JASON HECKERT whose telephone number is (571)272-2702. The examiner can normally be reached on Mon. to Friday, 9:00 - 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571)272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael Barr/
Supervisory Patent Examiner, Art Unit 1792

JMH